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Forest Insect and Disease Conditions

Yukon Territory 1986

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Service canadien des forêts

INTRODUCTION

This report summarizes forest insect and disease conditions in the Yukon Territory in 1986. Pests are listed by host with emphasis given to those capable of sudden damaging outbreaks.

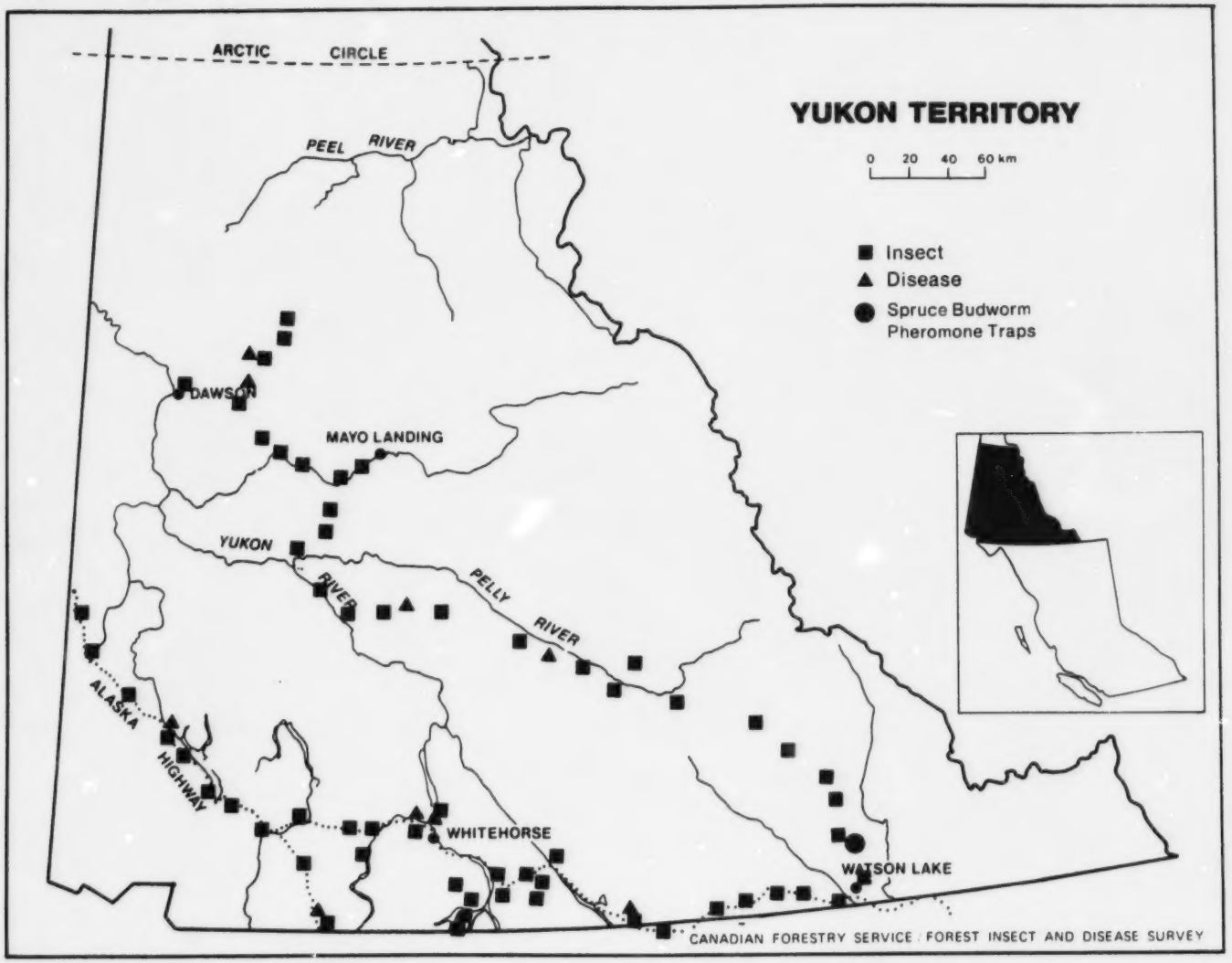
During the two week survey in late June and early July, 50 permanent forest pest sample sites were visited in stands from Watson Lake east to the Haines road and north to the Ogilvie Mountains along the Dempster Hwy. Over 80 insect and disease samples were collected (Map 1). Special surveys included: assessment of a potential lodgepole pine beetle infestation near Mayo; surveys for diamond willow disease, and pests of young stands.

SUMMARY

Eastern spruce budworm defoliation of primarily white spruce increased to light and moderate over more than 1 000 ha in the LaBiche River Valley. Spruce broom rust infected white and black spruce throughout the Territory, but was particularly prevalent between Watson Lake and Ross River and between Haines Junction and Beaver Creek.

Spruce gall aphid infested new shoots of young spruce near Watson lake and Stewart Crossing. Cone stripping by squirrels caused terminal and branch tip mortality on tens of thousands of lodgepole pine between Jakes Corner and Watson Lake. Endemic populations of lodgepole pine beetle infested one stressed tree near Mayo but pose no threat to surrounding green timber. Needle casts lightly to moderately infected primarily lower crown needles on lodgepole pine at various locations throughout the Territory, resulting in some premature needle loss. Surveys of young lodgepole pine stands revealed low levels of damage caused by a variety of pests, the most notable being Comandra blister rust, stem girdling by rodents and the abovementioned squirrel damage.

For the second consecutive year, large aspen tortrix populations remained at relatively low levels with small areas of moderate defoliation of trembling aspen near Stewart Crossing and light defoliation near Jake's Corner and on the east side of Little Atlin Lake. Poplar borers killed or weakened 90% of the trembling aspen in stands between Mayo and Stewart Crossing, and caused significant but lower mortality between Stewart Crossing and McQueston.



Map 1. Locations where one or more forest insect and disease samples were collected and pheromone traps located in 1986.

SPRUCE PESTS

Fir spruce budworms, Choristoneura spp.

Populations of the eastern spruce budworm, C. fumiferana caused light and moderate defoliation on white spruce over an undetermined area in the LaBiche River valley in the extreme southeast corner of the Territory. During a July 7 aerial survey from Fort Nelson to map budworm defoliation in the Liard-Fort Nelson rivers valleys, the damage was seen to continue across the border into the Yukon in the same area where trace amounts of defoliation were recorded in 1985.

The infestation is a small extension of a major outbreak which covers 95 000 ha in B.C., stretching from beyond Liard River Hot Springs and following the Liard River north well into the Northwest Territories. Based on the apparent health of the B.C. larval population and historic infestation patterns, the infestation is expected to continue in 1987.

For the third time since 1983, adult male populations of the two principle species of budworm were monitored by pheromone traps near Watson Lake (Table 1).

Table 1. Average numbers of two species of spruce budworm caught in pheromone baited sticky traps near Watson Lake from 1983-1986. Yukon Territory, 1986.

Pheromone[1] (5% conc)	1983	1984	1986	Species
A	95	44	96	C. orae
B	95	81	54	C. fumiferana

[1] A acetate
B aldehyde

The trapping program provides information on the distribution and fluctuating populations of the two species over time. The Watson Lake traps consistently attracted more C. orae than those placed in the Fort Nelson and Liard River areas in northeastern B.C. where C. fumiferana infestations are chronic and currently active. No distribution patterns have yet emerged from the trap data collected. The trapping program will continue in 1987.

Spruce broom rust, Chrysomyxa arctostaphyli

This disease is the most widespread and perpetual problem affecting white and black spruce throughout their range in the Yukon. Brooms were particularly evident in trees along the Robert Campbell Hwy. between Watson Lake and Ross River and along the Alaska Hwy. between Haines Jct. and Beaver Creek. Observations suggest that infections cause minor growth loss and greatly increase the occurrance of top dieback, but are rarely directly connected with tree mortality.

Spruce aphid, Pineus pinifoliae

A 2 ha young natural stand of mixed white spruce and lodgepole pine 10 km north of Watson Lake was examined following reports of premature cone crops on the young trees. More than 30% of the branch tips on 80% of the young spruce supported spruce aphid galls which to some degree resembled cones. In a young spruce stand near Stewart Crossing, 5% of the branch tips of all trees were infested.

Repeated gall formation on new growing tips will result in some growth loss, but trees quickly return to full vigour when aphid populations return to endemic levels.

PINE PESTS

Squirrel cone stripping

Tens of thousands of immature fire-regenerated lodgepole pine in scattered stands between Jake's Corner and Watson Lake exhibited damage caused by squirrels stripping the cones from the distal whorls of both stems and branches (Photo 1). The highest concentration of damage was seen at Km 1360 near Jake's Corner where nearly 40% of the terminals in a 40-year-old pine stand were killed over an area of 5 ha. Beyond this centre, damage was evident but at a much lower frequency appearing in 2-10 ha pockets and affecting up to 20% of the trees. These pockets were sporadic in young lodgepole pine stands for at least 20 km north of Johnson's Crossing along the Canol road, and as far east as Km 1040.

Photo available upon request from:

Pacific Forestry Centre
Canadian Forestry Service
506 West Burnside Road
Victoria, B.C. V8Z 1M5

Attention: R.W. Garbutt

Samples taken from four different sites along the 320 km all showed identical symptoms, consisting of small deep gashes in the stem in the shape of an inverted teardrop, approximately 2 cm long by 1 cm wide. There were normally three gashes spaced around the circumference of the stems and branches just below the outermost branch whorl, corresponding to the sites of cone production. Squirrels had stripped the young cones from the trees sometime between late fall and early spring and, though the resulting wounds did not girdle the stems, the flow of moisture through remaining tissues was greatly reduced and these tips became desiccated and eventually died.

This is the first recorded instance of extensive damage of this nature in the Yukon or B.C., and the reasons for its sudden occurrence are not fully understood.

Lodgepole pine beetle, Dendroctonus murrayanae

The lower bole of a single lodgepole pine which had been partially pushed over by heavy equipment at Rusty Creek near Mayo was infested with lodgepole pine beetle. This stand is one of the most northerly lodgepole pine provenances in the Yukon and cones are regularly harvested in the area. During the previous few years harvesting had been facilitated by the felling of cone bearing trees, resulting in lodgepole pine beetle attacks to the stumps and boles. Though most of the material had been disposed of by June 1986, the stand was checked to ensure that the beetle had not entered any standing healthy trees. Attacks on this single tree pose no threat to any surrounding healthy timber.

Near the north end of Kusawa Lake in the Takhini R. campsite, a single stressed lodgepole pine had been strip attacked in 1985 near the root collar. No repeat attacks on this or any surrounding trees were found in 1986.

Pine needle casts. Lophodermella spp.

Half of the year-old and older needles in an approximately 13-year-old stand of lodgepole pine at Km 432 of the Robert Campbell Hwy. were infected by needle cast. The problem persisted to a lesser degree on all age pine for 5 km past the young stand. At the Takhini Experimental Forest Reserve near Whitehorse 50% of the lodgepole pine in a family provenance plantation were infected. An average of 30% of the year-old and older lower crown needles were discolored.

Joint Canada-Sweden lodgepole pine trial

In co-operation with a Canada-Sweden interagency project, pest conditions in a recently planted lodgepole pine trial located at the Takhini Experimental Forest Reserve near Whitehorse were evaluated by CFS, FIDS in early July.

The plantation had been established for only one week prior to the visit and exhibited no pest related problems. Surrounding stands were surveyed for problems which could later be transmitted to the plantation. Comandra blister rust (Cronartium comandrae) and western gall rust (Endocronartium harknessii) infected about 1% of the stems of densely stocked lodgepole pine saplings adjacent to the plantation. In a nearby provenance trial, young

lodgepole pine were moderately (50% of the needles on 30% of the trees) infected with an unidentified needle disease which, if it becomes established in the plantation, would significantly weaken the trees.

The plantation was established as a trial to test the disease resistance of lodgepole pine grown from seed produced in Swedish seed orchards. Seed orchard trees had, in turn, been grown from seed obtained from northern latitude provenances in B.C. and the Yukon. In addition to lodgepole pine, Swedish Scots pine, Siberian larch and Norway spruce were planted.

Further surveys will be conducted in future years.

DECIDUOUS TREE PESTS

Large aspen tortrix, Choristoneura conflictana

Defoliation of trembling aspen by the large aspen tortrix remained at relatively low levels within the Yukon for the second successive year. Light to moderate defoliation was seen for 10 km beginning at Km 655 of Hwy 2, north of Stewart Crossing. Patches over a total of 1 000 ha were lightly defoliated on south facing slopes 5 km east of Jake's Corner, and between km 5 and 8 on west facing slopes above the east side of Little Atlin Lake.

Historical patterns suggest that tortrix populations will remain low in 1987.

Diamond willow disease, Cytospora sp.

Throughout their range within the Yukon, willows are affected by a canker disease which causes diamond shaped fasciations, much sought after by woodworking hobbyists. The disease was particularly common between Beaver Creek and Kluane Lake and along the Haines Road between Haines Jct. and the B.C. border. Though not isolated to date from samples sent from the Yukon, Cytospora sp. fungus has been isolated in Alaska and is suspected as the causal agent.

Infection is thought to be initiated when a tree undergoes drought stress.

The canker is slow to develop but eventually kills the stem. Further sampling will be done in 1987 to verify the causal agent.

Poplar borer, Saperda calcarata

Open grown trembling aspen 15 km east of Stewart Crossing were severely infested with poplar borers. Ninety percent of all age trees showed evidence of attack at the root collar, but less than half of these attacks were current. About 40% of the smaller trees (<6 cm dbh) had been killed by the boring and an additional 10%, primarily larger trees, had broken off at or near the ground level because larval boring had significantly weakened the stems. Similar damage was common but less severe (10% total mortality) in aspen stands along Hwy. 2 for 10 km north of Stewart Crossing.

This pest commonly occurs throughout the Yukon and, though it kills many young aspen, is not considered a major forest pest.

Aspen leaftiers, Sciaphila duplex, Compsolechia niveopulvella

Damage by S. duplex was observed in trembling aspen and willow stands at widespread locations throughout the Yukon. At Fisheye Lake near Faro, 10% of the leaves of lakeside willows were rolled and tied. Similar damage was associated with large aspen tortrix, defoliation at Km 660 of Hwy. 2 south of Dawson City, as was very light (1% of leaves) damage at Km 7 of Hwy. 7, beside Little Atlin Lake. Similar damage caused by C. niveopulvella occurred in a young aspen stand just west of Takhini, where 15% of the leaves were rolled.

Neither of these insects is considered a major forest pest.

Western tent caterpillar, Malacosoma californicum pluviale

In early June some plant stock including Saskatoon berry, sour cherry and crabapple was brought to the Adorna Nursery in Whitehorse from a nursery in Langley B.C. The stock was subsequently found to be infested with western tent caterpillar (a major infestation occurred on the lower mainland in 1986). When the pest was identified all stock was sprayed with Malathion. When CFS, FIDS visited the nursery in early July, no sign of the insect remained.

Western tent caterpillar is a common defoliator of a range of deciduous species in southern B.C., and it is not known whether a tent caterpillar population could survive in the Yukon. As yet, no verified collections of the insect have been made in the Territory. Specimens, however, have been collected at Yellowknife and Fort Smith in the Northwest Territories, so it is possible that quick action averted the establishment of the tent caterpillar as a new pest in the Whitehorse area.

MULTIPLE HOST PESTS

Climatic injury

Winter drying, often referred to as red belt, was seen this year in a lodgepole pine stand on the south facing mountain slopes between Carcross and Tagish, covering approximately 1 000 ha between 1 100 and 1 300 meters in elevation. Similar damage was seen along east facing slopes above Simpson Lake north of Watson Lake over more than 500 ha.

In some locations such as eastern slopes of the Rockies, foliar mortality caused by winter drying is quite common on lodgepole pine. Sudden thaws and warmer weather in spring stimulate physiological processes within the tree resulting in moisture loss from the foliage through transpiration. Because the groundwater is still frozen this moisture cannot be replaced, and needles, primarily in the crown fringes dessicate and die. Unless this problem recurs in successive years, trees normally refoliate and recover in the following year.

PESTS OF YOUNG STANDS

Four young naturally regenerated lodgepole pine stands were examined in 1986 for the occurrance of insect or disease damage that could adversely affect growth and yield. The only significant problem encountered was squirrel damage (see Pine Pests) in two stands between Jake's Corner and Watson Lake. Results of these surveys are summarized in Table 2.

Table 2. Pests of young stands, Yukon Territory, 1986.

Location	Stand Age	Pest	% Stand Affected	Remarks
Km 1360 Alaska Hwy.	40 yr.	Squirrels	40% terminals killed	Caused by stripping cones.
		Western gall rust *Endocronartium harknessii*	3% branch galls	Common in many young stands.
Km 1130 Alaska Hwy.	30 yrs.	Rodent feeding	10% trees killed by girdling	Good agent for thinning out densely stocked stands.
		Squirrels	10% trees in small pockets	Widespread but occurring only in small centres.
		Western gall rust *Endocronartium harkenssii*	<1% trees with branch galls	Common in many young stands.
Km 432 Robert Campbell Hwy.	13 yrs.	*Lophodermella* sp.	av. 30% needles on 90% trees	Occurred primarily in lower crown.
		needle blight	av. 30% needles 20% LP forked + otherwise deformed	Christmas tree gatherers strongly suspected.
		Comandra blister rust *Cronartium comandrae*	<1% infected	
		Rodent feeding	1% trees	Trees girdled by recent (1985/86) feeding, effective stand thinning agent.
		2° Scolytid beetle *Pityogenes plagiatus knechteii*	1%	Attacks were only in trees girdled by rodents.
		pine pitch midge (Cecidomyiidae)	10% of branches on 20% of trees	Caused minor branch crooking.
		northern pitch twig moth, *Petrova albicapitana*	old attacks on <1% of trees	
Alaska Hwy	28 yr.	Comandra blister rust *C. comandrae*	2%	
		Rodent girdling	1%	
		2° Scolytid beetle *Pityogenes plagiatus knechteii*	2%	Affected recently killed - severely stressed trees only.
		pine pitch midge (Cecidomyiidae)	100 trees 10% branches	Caused minor branch crooking.
		trembling aspen	10% plantation area NSR	Small patches of aspen were common throughout pine stand.